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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
AMINI, JAVID A	

ART UNIT	PAPER NUMBER
2672	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/711,859	TUOMI ET AL.	
	Examiner	Art Unit	
	Javid A Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Arguments

Applicant's arguments filed 11/02/2004 have been fully considered but they are not persuasive.

Applicant on page 6, lines 20-23 argues the Examiner refers to the Z-buffer and the back buffer as the secondary Z-value.

Examiner's reply: Examiner strongly disagrees with the Applicant's statement, because the correct statement from pervious office action is as follows:

Stroyan in fig. 4 illustrates frame buffers (back and front) with z-buffer (step 154). The z-buffer in the frame buffer back can be called a space for secondary z-value. Examiner's interpretation: Stroyan in fig. 4 illustrates two different frame buffers, one is for the front (142b) and the other one is for the back (142a). Each of the frame buffer contains Z-buffer (shown by number 154). Therefore, Z-buffer in 142b can be called a "first Z-value" and Z-buffer in 142a can be called a "second Z-value" or vise versa.

Applicant on page 6, lines 23-24 argues the claims 3 and 12 require the second buffer provides for storage of an antialiasing value and this value is associated with the edge pixel. Examiner's reply: Stroyan in col. 3, lines 36-46 teaches that the frame buffer circuitry includes a first memory segment for storing color values associated with pixels, a second memory segment for storing alpha values associated with the pixels, a third memory segment for storing depth values associated with the pixels, and <u>a fourth memory segment for storing anti-alias blending information associated with the pixels.</u>

Applicant on page 7 lines 1-3 argues that the reference Stroyan does not teach the anti-aliasing value is function of the polygon.

Examiner's reply: in order to be explicit about the definition of a polygon, Stroyan in col. 4, lines 37-40 teaches a geometry accelerator 123 receives vertex data from the host CPU 112 that defines the primitives (e.g., triangles, polygons, etc.) that make up the image to be displayed on the display 121. Stroyan in col. 9 lines 5-9 discloses examples that are known in the art, for example: U.S. Pat. No. 5,123,085 to Wells et al., which is incorporated by reference in its entirety, a method and apparatus for rendering anti-alias polygons, and further discloses a method for determining the coverage of pixels which form edges of polygons. Stroyan in cols. 4-5, lines 66-67; 1-5 respectively discloses the illumination component 128, hereinafter referred to as a lighting machine, calculates the final colors of the vertices of the primitives based on the both vertex data and on the locations of the light source(s) and the user relative to the object being displayed. The system CPU 112, through software, ultimately conveys the data for these parameters to the graphics accelerator 123 and its memory. Examiner's interpretation: Stroyan inherently teaches the anti-aliasing value is function of the polygon (the vertices of the primitives). Examiner's comment: the vertices of the primitives (i.e. polygon) define the limitations of the area that creates an anti-aliasing value.

A question for Applicant: Base on what does the reference Stroyan create an anti-aliasing value, if it is not function of the vertices of the primitives (i.e. polygon)?

Examiner's suggestion: Applicant requires working on claim languages of the invention and correlates a detail of the claim languages in claims 9-10 with respect to the independent claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claim 3-20 rejected under 35 U.S.C 102(e) as being anticipated by Stroyan US patent 6,429,877 B1, filled date of July 30, 1999.

2. Claim 3.

As for claim 3, "determining coverage parameters associated with an edge pixel on an edge of a polygon being rendered that is stored in a first buffer; creating an antialiasing value representing the relationship of the edge pixel to its surrounding neighbors as to the amount of color that is to be blended into the edge pixel of a color corresponding to that of its surrounding neighbors", Stroyan discloses and illustrates in (col. 8, lines 50-67) and Fig. 6, that is illustrating the top-level functional operation of a method for preserving color blending information, in accordance with one aspect of the present invention. In accordance with this method, a first step (step 202) may be to determine whether a 10 given pixel is an edge pixel (i.e., a pixel that borders a primitive edge). If not, then the pixel color may be directly written into the appropriate memory segment of the frame buffer (step 204). Thereafter, a coverage value of one (binary value "11111") may be written to the extra byte 162 of memory segment 160, corresponding to the current pixel (step 206). Thereafter, the method may proceed to the next pixel (step 208), and

the foregoing steps may be repeated for each pixel of a rasterization. If a given pixel is determined to be an edge pixel, then the method may determine the coverage area for the current pixel (step 210). In this regard, the coverage area is the percentage of the pixel (containing the center point) that lies within the edge of the primitive.

"storing the antialiasing value in a second buffer in association with the edge pixel in the first buffer", Stroyan discloses in abstract that a system is provided having frame buffer circuitry uniquely configured for rendering an antialiased graphics scene. In accordance with one embodiment, the frame buffer circuitry includes a first memory segment for storing color values associated with pixels, a second memory segment for storing alpha values associated with the pixels, a third memory segment for storing depth values associated with the pixels, and a fourth memory segment for storing anti-alias blending information associated with the pixels.

"which antialiasing value is retained as a function of the polygon being in the foreground during the rendering operation of a pixel in the polygon", Applicant uses the language of "during the rendering the antialiasing value is retained". Stroyan in col. 3, lines 45-46 discloses that a fourth memory segment for retaining anti-alias blending information associated with the pixels. The reference Stroyan in col. 6, lines 5-52 discloses complete information about the Z-buffer and the data is written in the frame buffer. Stroyan in fig. 4 illustrates frame buffer back and front with z-buffer (step 154). The z-buffer in the frame buffer back can be called a space for secondary z-value. Stroyan in col. 3, lines 37-46 discloses that a system is provided having frame buffer circuitry uniquely configured for rendering an anti-aliased graphics scene. In accordance with one embodiment, the frame buffer circuitry includes a first memory segment for storing color values associated with pixels, a second memory segment for storing alpha values associated

with the pixels, a third memory segment for storing depth values associated with the pixels, and a fourth memory segment for storing anti-alias blending information associated with the pixels.

3. Claim 4.

As for claim 4, " wherein the created antialiasing value is a single antialiasing value represented as a digital word", the step is inherent because all created value/s represented by digital word.

4. Claim 5.

As for claim 5, "wherein the step of creating the antialiasing value comprises the steps of: supersampling the edge pixel during rendering thereof to provide a plurality of subpixels, wherein each of the subpixels contains information as to coverage by the polygon", Stroyan discloses in (col. 2, lines 52-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels . In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated.

"converting the coverage pattern of the subpixels into a single antialiasing value that represents the positional relationship of the coverage as to neighboring pixels", Stroyan teaches in (col. 3, lines 50-54)) that the region of interest is effectively extended to pixels that touch the primitive edge in any amount. This allows the invention to represent minority coverage of a pixel by an appropriate blending by a coverage percentage.

5. Claim 6.

As for claim 6, "wherein the single antialiasing value represents both coverage percentage and the coverage pattern", the step is inherent because both coverage (percentage and pattern) are sharing the same information.

6. Claim 7.

As for claim 7, "wherein the single antialiasing value comprises a map of the subpixels", Stroyan teaches in (col. 2, lines 51-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels . In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated.

7. Claim 8.

As for claim 8, "wherein the single antialiasing value has a plurality of bits associated therewith in a digital word of a length equal to the number of subpixels, with each bit having a value that represents whether the subpixel is covered", the step is inherent because all created value/s represented by digital word and the value is representing the subpixel.

8. Claim 9.

As for claim 9, "further comprising the step of filtering the edge pixel prior to a display operation, comprising the steps of: retrieving the edge pixel and the associated antialiasing value; determining the color of at least one adjacent pixel to the edge pixel; blending the color of the at least one adjacent pixel with the edge pixel as a function of the positional relationship

of the subpixels in the supersampled edge pixel to provide an antialiased pixel; and storing the antialiased pixel in a frame buffer", see rejection of claims 3 and 5.

9. Claim 10.

As for claim 10, "wherein the step of determining comprises the step of determining the color of at least two adjacent pixels to the edge pixel, and the step of blending comprises blending the color of the at least two adjacent pixels with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to the at least two adjacent pixels to provide the antialiased pixel", see rejection of claims 5 and 7.

10. Claim 11.

As for claim 11, "wherein the step of creating the antialiasing value for the edge pixel is operable to further create a depth value in association with the antialiasing value, which depth value comprises the depth value of the subpixel that is covered by the foremost polygon", Stroyan teaches in (col. 2, lines 51-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels . In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated.

11. Claim 12.

As for claim 12, "A graphics engine for antialiasing edge pixels in a rendering operation, comprising: a rendering engine for determining coverage parameters associated with an edge pixel on an edge of a polygon being rendered that is stored in a first buffer; an antialiasing engine

for creating an antialiasing value representing the relationship of the edge pixel to its surrounding neighbors as to the amount of color that is to be blended into the edge pixel of a color corresponding to that of its surrounding neighbors; and a second buffer for storing the antialiasing value in association with the edge pixel in said first buffer", Stroyan discloses and illustrates in (col. 8, lines 50-67) and Fig. 6, that is illustrating the top-level functional operation of a method for preserving color blending information, in accordance with one aspect of the present invention. In accordance with this method, a first step (step 202) may be to determine whether a 10 given pixel is an edge pixel (i.e., a pixel that borders a primitive edge). If not, then the pixel color may be directly written into the appropriate memory segment of the frame buffer (step 204). Thereafter, a coverage value of one (binary value "11111") may be written to the extra byte 162 of memory segment 160, corresponding to the current pixel (step 206). Thereafter, the method may proceed to the next pixel (step 208), and the foregoing steps may be repeated for each pixel of a rasterization. If a given pixel is determined to be an edge pixel, then the method may determine the coverage area for the current pixel (step 210). In this regard, the coverage area is the percentage of the pixel (containing the center point) that lies within the edge of the primitive. Stroyan discloses in abstract that a system is provided having frame buffer circuitry uniquely configured for rendering an antialiased graphics scene. In accordance with one embodiment, the frame buffer circuitry includes a first memory segment for storing color values associated with pixels, a second memory segment for storing alpha values associated with the pixels, a third memory segment for storing depth values associated with the pixels, and a fourth memory segment for storing anti-alias blending information associated with the pixels. "which antialiasing value is retained as a function of the polygon

being in the foreground during the rendering operation of a pixel in the polygon", [Examiner's interpretation: Applicant uses the language of "during the rendering the antialiasing value is retained", meaning after rendering is done the antialiasing value is not retain.] The reference Stroyan in col. 6, lines 5-52 discloses complete information about the Z-buffer and the data is written in the frame buffer. Stroyan in fig. 4, illustrates frame buffer back and front with z-buffer (step 154). The z-buffer in the frame buffer back can be called a space for secondary z-value. Stroyan in col. 3, lines 37-46 discloses that a system is provided having frame buffer circuitry uniquely configured for rendering an anti-aliased graphics scene. In accordance with one embodiment, the frame buffer circuitry includes a first memory segment for storing color values associated with pixels, a second memory segment for storing alpha values associated with the pixels, a third memory segment for storing depth values associated with the pixels, and a fourth memory segment for storing anti-alias blending information associated with the pixels.

12. Claim 13.

As for claim 13, "wherein the created antialiasing value is a single antialiasing value represented as a digital word", see rejection of claim 12.

13. Claim 14.

As for claim 14, "wherein said antialiasing engine comprises: a supersampling engine for supersampling the edge pixel during rendering thereof to provide a plurality of subpixels, wherein each of the subpixels contains information as to coverage by the polygon; and a conversion device for converting the coverage pattern of the subpixels into a single antialiasing value that represents the positional relationship of the coverage as to neighboring pixels", Stroyan discloses in (col. 2, lines 52-60) that anti-aliasing methods are generally classified into

a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels . In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated. Stroyan teaches in (col. 3, lines 50-54)) that the region of interest is effectively extended to pixels that touch the primitive edge in any amount. This allows the invention to represent minority coverage of a pixel by an appropriate blending by a coverage percentage.

14. Claim 15.

As for claim 15, "wherein the single antialiasing value represents both coverage percentage and the coverage pattern", the step is inherent because both coverage (percentage and pattern) are sharing the same information.

15. Claim 16.

As for claim 16, "wherein the single antialiasing value comprises a map of the subpixels", Stroyan teaches in (col. 2, lines 51-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels . In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated.

16. Claim 17.

As for claim 17, " wherein the single antialiasing value has a plurality of bits associated therewith in a digital word of a length equal to the number of subpixels, with each bit having a value that represents whether the subpixel is covered", the step is inherent because all created value/s represented by digital word and the value is representing the subpixel.

17. Claim 18.

As for claim 18, "and further comprising a filter processing engine operable to filter the edge pixel prior to a display operation by: retrieving the edge pixel and the associated antialiasing value; determining the color of at least one adjacent pixel to the edge pixel; blending the color of the at least one adjacent pixel with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to provide an antialiased pixel; and storing the antialiased pixel in a frame buffer", Stroyan discloses and illustrates in (col. 8, lines 50-67) and Fig. 6, that is illustrating the top-level functional operation of a method for preserving color blending information, in accordance with one aspect of the present invention. In accordance with this method, a first step (step 202) may be to determine whether a 10 given pixel is an edge pixel (i.e., a pixel that borders a primitive edge). If not, then the pixel color may be directly written into the appropriate memory segment of the frame buffer (step 204). Thereafter, a coverage value of one (binary value "11111") may be written to the extra byte 162 of memory segment 160, corresponding to the current pixel (step 206). Thereafter, the method may proceed to the next pixel (step 208), and the foregoing steps may be repeated for each pixel of a rasterization. If a given pixel is determined to be an edge pixel, then the method may determine the coverage area for the current pixel (step 210). In this regard, the coverage area is the percentage of the pixel (containing the center point) that lies within the edge of the

primitive. Stroyan discloses in abstract that a system is provided having frame buffer circuitry uniquely configured for rendering an antialiased graphics scene. In accordance with one embodiment, the frame buffer circuitry includes a first memory segment for storing color values associated with pixels, a second memory segment for storing alpha values associated with the pixels, a third memory segment for storing depth values associated with the pixels, and a fourth memory segment for storing anti-alias blending information associated with the pixels. Stroyan discloses in (col. 2, lines 52-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels . In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated.

18. Claim 19.

As for claim 19, "wherein said filter is operable to determine the color of at least two adjacent pixels to the edge pixel, and blend the color of the at least two adjacent pixels with the edge pixel as a function of the positional relationship of the subpixels in the supersampled edge pixel to the at least two adjacent pixels to provide the antialiased pixel", Stroyan teaches in (col. 2, lines 51-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels. In area sampling, the area of the polygon

occupying a pixel is calculated and then the color value of the area ratio is calculated. And also see rejection of claim 3.

19. Claim 20.

As for claim 20, "wherein said antialiasing engine is operable to further create a depth value in association with the antialiasing value, which depth value comprises the depth value of the subpixel that is covered by the foremost polygon", Stroyan teaches in (col. 2, lines 51-60) that anti-aliasing methods are generally classified into a super-sampling method and an area sampling method. In the super-sampling method, the color value of a pixel is calculated by obtaining the color values of several sub-pixels within the pixel and averaging (or blending) the obtained color values of the sub-pixels. In area sampling, the area of the polygon occupying a pixel is calculated and then the color value of the area ratio is calculated.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 571-272-7654. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2672

Jeffery A. Brier

Javid Amini